B-2 Spirit

The B-2 *Spirit* is a land-based, long-range bomber capable of delivering both conventional and nuclear munitions. The aircraft features a flying wing design and incorporates advanced "stealth" technology to reduce its radar observability and its infrared (IR) signature. The crew consists of two pilots, one of whom serves as the mission commander.

B-2 initial operational test and evaluation (IOT&E) concluded in June 1997. However, the aircraft did not fully meet operational requirements at the conclusion of IOT&E. Several deficiencies identified during IOT&E were described in the DOT&E FY01 annual report. Since then, the B-2 development program initiated a series of upgrades aimed in part at correcting these deficiencies.

Additional upgrades have been initiated, but are not yet ready for DT&E. These initiatives are intended to enhance capability and improve the aircraft's operational effectiveness and suitability. These enhancements include additional low observable (LO) improvements and LO diagnostic tools, Guided Bomb Unit (GBU) 38 and enhanced GBU (EGBU) 28 capability, Link 16, Extremely High Frequency Satellite Communication, and an upgrade to the aircraft's radar frequency. Planning for the B-2 radar upgrade began in FY02.

TEST & EVALUATION ACTIVITY

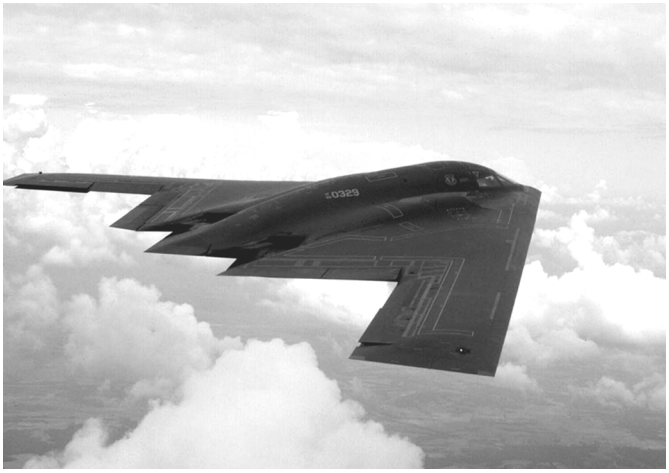
B-2 follow-on test and evaluation continues. FY02 efforts focused on the evaluation of upgrades to the aircraft operational flight program software, the mission planning system, weapon delivery capability, aircraft survivability to specific threats, and the reliability and maintainability of LO systems. Test planning for the B-2 radar upgrade began in FY02.

A test and evaluation master plan (TEMP) to support the B-2 sustainment phase was submitted to OSD in July 1999. The TEMP was returned to the Air Force with comments and has yet to return to OSD for approval. The Air Force plans to submit a revised TEMP to serve as a capstone document and submit a TEMP appendix on the B-2 radar upgrade.

TEST & EVALUATION ASSESSMENT

Although enhancements to B-2 capability occurred in FY02, overall effectiveness and suitability of the B-2 have not noticeably improved. Enhancements include:

- Combat Track II, providing beyond line-of-sight secure communications and situational awareness.
- Mission planning and Common LO Auto Router performance to enable faster mission planning with advanced weapon capability (e.g., Joint Air-to-Surface Standoff Munition).
- Integrated Functional Capability updates, providing Time Sensitive/Flexible Targeting capabilities.
- New Defensive Mission System (DMS) mission data files tailored to key areas of responsibility.



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Assessments, based on DOT&E review of Force Development Evaluations, are provided for each of the five B-2 Critical Operational Issues (COIs):

Rapid Strike: This COI is assessed to be marginally satisfactory. Time to prepare and launch the B-2 is considered marginally satisfactory based on generation exercises conducted in FY02. If aircraft are allowed to accumulate a large number of LO discrepancies, generation times cannot be met. Nevertheless, since

aircraft with LO defects can still be flown, training schedules can be met. Operational commitments are supported by holding a number of aircraft ready on the ground, while conducting training with the remaining aircraft.

Sustained Operations: This COI again does not meet requirements. Some improvements have already been fielded, but the most promising near-term improvement to LO maintainability (advanced high frequency materials or AHFM) has neither undergone Operational Test and Evaluation (OT&E) nor reached the operational squadrons. AHFM may improve LO reliability and maintainability, but testing in an operational environment must occur to validate its effectiveness and suitability. Although the B-2 proved to be an effective weapon delivery platform capable of striking targets anywhere in the world, it is unable to support the operations tempo originally envisioned and specified by Air Combat Command, primarily because of continuing unreliability and difficulty in maintaining LO systems.

Mission Capable Rate (MCR) for FY02 continues to fall short of ORD requirements. Although improvement occurred in FY02, MCR has consistently been below standard. Improvement in FY02 cannot be regarded as significant unless sustained over a longer period of time. The required deployed sortie generation rate has yet to be demonstrated and is unlikely to be achievable without substantial improvement to reliability and maintainability of all B-2 systems.

Mission Survivability: This COI is satisfactory except for DMS. The DMS does not provide adequate situational awareness to avoid pop-up threats. A new mission data file was implemented in FY01 but did not improve performance. In addition, rapid reprogramming of mission data files to accommodate new geographic areas of responsibility or new threat systems is a time consuming process and not very responsive. More funding and personnel are required to make this DMS feature truly rapid and responsive.

Survivability assessments continued in FY02. These assessments included evaluation of the effectiveness of standoff jamming platforms in support of B-2 employment. Although the B-2's LO signature is considered satisfactory in the present configuration, introduction of new LO materials (e.g., AHFM) require continued testing to update or validate signature templates.

Weapons Effectiveness: This COI is satisfactory except for the Joint Stand Off Weapon (JSOW-A). Launches of four JSOW-A weapons as part of weapons integration tests were conducted in FY02. However, JSOW-A testing was suspended in August 2002 pending resolution of potential JSOW-A employment shortfalls discovered during the modeling of releases within the typical B-2 operational envelope. Further testing is needed before B-2/JSOW effectiveness can be stated with confidence.

Operational flight program software corrected anomalies seen in earlier Joint Direct Attack Munition (JDAM) tests and during operational employment. Ten JDAM weapons were dropped in FY02. Miss distances for these weapons were well within required values.

Reliability, Maintainability, and Deployability: This COI is assessed as unsatisfactory, due to poor reliability and maintainability of B-2 systems (particularly LO systems), and because deployability remains undemonstrated.

A number of improved materials and processes were introduced in prior years to improve LO reliability and maintainability. Several LO improvement and durability initiatives are partially fielded and show promise. B-2 Maintenance Man Hours per Flight Hour has improved over the past several years, largely because of more efficient management of LO maintenance.

The most significant LO improvement initiative is the AHFM configuration. However, this configuration has been applied only to the B-2 test aircraft at Edwards Air Force Base. Development tests were performed, but further assessment of AHFM must await operational testing at the main operating base. If tests in an operational environment validate expectations, AHFM should provide significant maintainability, sortie generation, and support cost improvements over current B-2 aircraft materials.

A deployable B-2 Shelter System was tested at Whiteman Air Force Base in FY01. Five follow-on production versions have been ordered and two are being erected at a potential deployment site. However, B-2 capability to conduct sustained operations in a deployed environment has yet to be demonstrated. A deployment evaluation exercise is planned for FY03.